

Manage growth, complexity and risk with scalable,
high-performance storage



IBM System Storage DS4700 Express Model



Highlights

- *Optimize performance with end-to-end 4 Gbps capable Fibre Channel interface technology*
- *Achieve up to 1550 MBps bandwidth for high throughput applications*
- *Support for Fibre Channel hard disk drives*
- *Centrally manage the DS4000™ series with the IBM System Storage™ DS4000 Storage Manager*
- *Increase connectivity through eight host channels with dual controllers*
- *Support for up to 112 disk drive modules with the attachment of six DS4000 EXP810 Expansion Units*
- *Designed to be NEBS-3 compliant, powered from a -48 V dc Telco industry-standard power source*

The challenge: Manage data to achieve low cost of ownership and high data availability

To successfully meet business goals, effective data management is essential. Optimized data management requires storage solutions with high data availability, strong storage management capabilities and powerful performance features. Your budget requires a low cost of ownership. By implementing scalable and cost effectively storage capacity, you can take advantage of emerging technologies as information demands change. Also, you can go beyond respond and recover in the case of outages with powerful, dynamic backup and recovery capabilities to help you protect data and prevent failure.

The solution: IBM System Storage DS4700 Express

Designed to provide lower total cost of ownership, high performance, robust functionality, and unparalleled ease of

use, IBM offers the IBM System Storage DS4700 Express. As part of the DS4000 series, the DS4700 Express offers:

- *High-performance 4 Gbps capable Fibre Channel connections.*
- *Up to 112 TB of physical storage capacity with 112 1 TB SATA disk drives.*
- *Powerful system management, data management and data protection features.*

The DS4700 Express expands from workgroup to enterprise-wide capability with six attached DS4000 EXP810 disk enclosures. The DS4700 Express DC Models are NEBS-3 compliant storage systems designed to be powered from a -48 Volt DC Telco industry-standard power source. The DS4700 Express is available in a 3U high enclosure and mounts in a 19-inch rack-mount package.

Achieve a lower total cost of ownership

Performance capabilities that can reduce the need for additional host ports can help you lower the total cost of ownership with DS4700 Express.

Data-intensive applications that demand increased connectivity can benefit from a high-performance 4 Gbps capable Fibre Channel interface. Get the capacity of eight 4 Gbps capable host channels directly attached to host servers or connected to a Fibre Channel storage area network (SAN). To achieve these speeds, four Gbps capable drives and IT infrastructure are required.

There are two ways to measure the performance of a SAN device megabytes per second (MBps), and input/output per second (IOPS). Assuming a 4 Gbps capable system, DS4700 Express provides up to 1550 MBps throughput with up to 121,500 IOPS. A 2 Gbps storage array can require up to twice as many host ports as a 4 Gbps array to deliver the throughput of four 4 Gbps ports. The DS4700 Express can help you free up or eliminate the need for additional host ports in the SAN for each array.

On the host side, if a server requires more than the minimum of two 2 Gbps host bus adapters (HBAs) for availability to attain the required performance, then that number can be halved with

4 Gbps. Fewer HBAs help lower the number of switch ports used and can help reduce overall cost.

Establish high data availability

Develop storage environments that can deliver unprecedented data availability with the help of DS4700 Express. Offering a choice of multiple redundant array of independent disks (RAID) levels and redundant, hot-swappable components, the disk storage system can help you maintain data availability and security.

Enhance resiliency with the IBM disk storage systems. Powerful dynamic capabilities help protect data and prevent failure, not just respond and recover. Recover quickly from disaster. Providing enterprise-class disaster recovery strategies, point-in-time copying IBM FlashCopy® enables copy with VolumeCopy and remote mirroring with Enhanced Remote Mirroring.

The DS4700 4 Gbps technology is backward compatible with 2 Gbps and even 1 Gbps. Meaning you need not replace your entire SAN with 4 Gbps

technology, but add the new technology incrementally. Of course, 4 Gbps products will slow down to the 2 Gbps or 1 Gbps speed if they are connected, but zoning can allow a rolling upgrade strategy with minimal disruption.

Enhance Information Lifecycle Management

Information insights help your business succeed in an ever-changing global marketplace. The IBM DS4000 series allows flexible access to information. The series also provides a broader range of scale and performance options to provide structure and context to information. As a result, you can build data management strategies that align with your information requirements. Managing information can be a key process for an IT organization. IBM DS4700 can help accommodate the changing value of data over time while maintaining data availability.

Increase performance

High-performance storage can help manage compute-intensive workloads. Excelling at IOPS and MBps, the DS4700 is a great fit for both transaction-oriented and bandwidth-intensive

applications. It is designed to easily satisfy performance-hungry workloads. Additionally, the DS4700 is a great choice for environments with intense replication requirements, because it can efficiently handle the additional performance demands of FlashCopy, VolumeCopy and Enhanced Remote Mirroring.

The DS4700 Express Model 72 has eight independent 4 Gbps FC host ports for direct-attachment to host (FC-AL) or fabric attachment to storage area networks (FC-SW). One of the first enterprise-class storage systems based on 4 Gbps FC technologies, the DS4700 can help enable customers to prepare for the future while making the most of their current infrastructure. It provides auto-negotiate FC connection speeds, allowing integration into an existing 1 Gbps or 2 Gbps infrastructure. The storage system also helps enable environments to benefit from performance and connectivity improvements, while helping protect investment when the SAN inevitably becomes 4 Gbps.

The four 4 Gbps drive connections support up to 112 disk drives with six attached DS4000 EXP810 disk enclosures. This makes the DS4700 Express a good choice for performance-oriented or capacity-oriented storage requirements. Models 70 and 72 are designed to support over 33.6 TB of Fibre Channel physical storage capacity.

The DS4700 expands its predecessor's history of flexibility with another configuration option, cache size. The DS4700 is available in two models:

- *Model 70 is designed to support up to 2 GB of physical cache memory (1 GB per controller).*
- *Model 72 can support up to 4 GB of physical cache memory (2 GB per controller).*

The DS4700 fits runs the same robust, yet intuitive, storage management software as previous storage systems in the series. Designed to allow maximum utilization of storage capacity and complete control over a rapidly growing storage environment.

Serve a wide range of storage consolidation and clustering applications

IBM DS4700 is an affordable, scalable storage server for storage consolidation and clustering applications. Its modular architecture, which includes Dynamic Capacity Addition and Dynamic Volume Expansion, can support on demand environments by enabling storage to grow as demands increase. Autonomic features such as online firmware upgrades and DS4000 Remote Support Manager also help enhance the system's usability.

The DS4700 can help consolidate direct-attached storage into a centrally managed, shared or storage area network (SAN) environment. With built-in support for eight Fibre Channel-attached servers, the need for additional switches is reduced or eliminated helping to make server clustering more cost-effective.

Expand your storage solution with the IBM System Storage EXP810 Storage Expansion Unit offering a 16-bay disk enclosure. Achieve up to 4.8 TB physical capacity per expansion unit using

16 Fibre Channel 300 GB disk drives, or up to 16 TB physical capacity per expansion unit using sixteen SATA 1 TB disk drives.

This expansion unit can accommodate the new optional 2 Gbps Fibre Channel Enhanced Disk Drive Modules (E-DDM). The unit contains redundant power and cooling modules, and Environmental Service Module (ESM) interfaces. The unit is also NEBS-3 compliant.

Each ESM Customer Replacement Unit (CRU) supports 2 Gbps or 4 Gbps Fibre Channel host connections and a 4 Gbps Fibre Channel loop. Both 2 and 4 Gbps Fibre Channel disk drives are supported. A switch on the front of the unit enclosure selects the speed of the entire enclosure, but not both at the same time.

Intermix Capabilities

The DS4700 Express helps support intermix of Fibre Channel and SATA disk drives within the controller. DS4700 Express also helps support attachment of EXP810, EXP710 and EXP100 to further enhance storage utilization.

Telco Options

The DS4700 Express Models 70S/T and 72S/T are NEBS-3 compliant and provide high-performance, high availability, business-critical storage including dc powered models that are especially suited for Telco industry environments.

Scalability throughout the DS4000 series

Because the DS4700 Express is designed to be highly scalable up to 112 Fibre Channel or SATA disk drives, it can be upgraded from a workgroup SAN to an enterprise network storage system. Upgrading can help provide the flexibility to grow with your business. In addition, by using IBM System Storage DS4000 Storage Manager software, multiple DS4700 Expresses can be combined to help address additional performance and capacity requirements, further enhancing your scalability options.

Another scalability feature of the DS4700 Express is Dynamic Capacity Expansion (DCE), which provides the ability to add DS4000 EXP810 enclosures to an existing DS4700 Express

while avoiding the need to stop operations. Adding these enclosures can help you bring unused storage online for a new host group or an existing volume to provide additional capacity on demand.

Upgrade to higher performing DS4000 series systems while keeping data intact and avoid disruptions during upgrades. The DS4700 Express supports online controller firmware upgrades to help provide better performance and functionality. Events such as upgrades to support the latest version of DS4000 Storage Manager or to add optional services such as DS4000 Service Alert or the new DS4000 Remote Support Manager can often be executed without stopping operations.

Centralize administration through DS4000 Storage Manager

The DS4000 Storage Manager software included with the DS4700 Express supports the centralized management of local and networked DS4000 series systems. The DS4000 Storage Manager allows administrators to quickly configure and monitor storage from a Java™ technology-based Web browser interface. It also allows them to customize and change settings as well

as configure new volumes, define mappings, handle routine maintenance, and dynamically add new enclosures and capacity to existing volumes. All without interrupting user access to data.

Failover drivers, performance tuning routines and cluster support are also standard features of the DS4000 Storage Manager. By providing these features and an intuitive user interface, the DS4000 Storage Manager can help reduce the complexity of storage management and the amount of time spent managing storage.

Enhance storage management capabilities

IBM DS4700 Express has several features designed to improve data management and storage system performance. Using the Storage Manager software, administrators can partition the DS4700 Express into as many as 128 virtual servers. This capability can help your IT organization strategically allocate storage capacity to achieve high utilization of storage space and low hardware and storage management costs. Instead of purchasing multiple RAID controllers with their own dedicated disks and management,

you can attach multiple servers to one central system—the DS4700 Express. The DS4700 Express provides hardware failover with dual controllers and common management.

Other DS4700 Express features that can help enhance data management and protection include FlashCopy, Dynamic Volume Expansion, VolumeCopy and Enhanced Remote Mirroring.

The FlashCopy feature enables point-in-time copies of logical volumes, which may be used for file restoration, backups, application testing or data mining.

Dynamic Volume Expansion allows administrators to resize logical volumes without disrupting users. This feature can work well for applications with rapidly growing data requirements, such as IBM Lotus Notes® and Microsoft® Exchange.

VolumeCopy feature provides full replication of one logical volume (source) to another (target) within the DS4700. VolumeCopy is designed to allow read-only access to the source volume during the copy process, and suspend writes to support point-in-time integrity.

Enhanced Remote Mirror consists of Global Mirror with Asynchronous Write-order Consistency, which is critical for mirroring multi-LUN applications, Global Copy with Asynchronous and Metro Mirror with Synchronous.

The DS4700 Express uses a common pool of hot-spare disk drives as a cost-effective way to help improve availability. IT administrators can determine the number of drives to allocate as spares.

Additional tools to help manage storage

The DS4700 is supported by a variety of IBM Tivoli® software products. IBM Tivoli Storage Manager, IBM Tivoli Storage Resource Manager and many other third-party hardware and software products can add to the capabilities of the DS4700 by enabling backup and storage reporting.

The IBM System Storage Proven™ program identifies and tests many of these products for interoperability with the DS4700 and other IBM disk products. Products in this program have been tested to help reduce or eliminate time-consuming installation and support issues. For more information, please visit ibm.com/storage/proven.

Service and support

The DS4700 Express has a three year, 9x5, next business day hardware warranty. Additional services for hardware installation, DS4000 Storage Manager configuration and advanced storage management are also available from IBM Global Services (IGS). IBM Support Line services can assist with using DS4000 Storage Manager helping to enable self-maintenance for the DS4000 system.

The optional DS4000 Remote Support Manager for Storage service enables the DS4700 to quickly notify the IBM Support Center when the system detects a problem. This notification can help reduce or eliminate the need for a service call. To help expedite diagnosis and repair of failed hardware and software, error alert messages from DS4000 Storage Manager can be forwarded through e-mail.

Competitive financing options from IBM Global Financing

Financing is available through IBM Global Services for a wide range of IBM products and services, including the DS4700 Express, for the duration of the financing term. This financing offers competitive rates, flexible terms, predictable costs and a fast approval process for DS4700 Express and associated software and services. For more information, please visit ibm.com/financing.

IBM System Storage DS4700 Express at a glance

Characteristics

Model	1814-70A/H/S/T, 1814-72A/H/S/T 1814-70S/T, 1814-72S/T (DC power supplies)
RAID controller	Dual active
Cache	Model 70A/70S: 2 GB Model 72A/72S: 4 GB Battery-backed
Host interface	8 host ports model 72, 4 host ports model 70—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, Auto-sensing 1 Gbps/2 Gbps/4 Gbps
Drive interface	4 drive ports—Fibre Channel (FC) Switched and FC Arbitrated Loop (FC-AL) standard, Auto-sensing 1Gbps/2 Gbps/4 Gbps
Supported drives	Supports 2 Gbps FC: 10K – 73.4 GB, 146.8 GB, 300 GB E-DDM, 15K – 36.4 GB, 73.4 GB, 146.8 GB E-DDM Supports 4 Gbps FC: 15k – 300 GB, 146.8 GB, 73.4 GB, 36.4 GB E-DDM Supports 4 Gbps SATA: 7.2K 500 GB/750 GB and 1 TB E-DDM Disk drives
RAID levels	0, 1, 3, 5, 6, 10
Storage partitions	4, 8, 16, 64 or 128 storage partitions
Maximum drives supported	Model 72A/H/S/T: 112 FC or 112 SATA drives (using 6 DS4000 EXP810 Expansion Units) Model 70A/H/S/T: 112 FC or 112 SATA drives (using 6 DS4000 EXP810 Expansion Units)
Fans and power supplies	Dual redundant, hot-swappable
Rack support	19-inch, industry-standard rack
Management software	IBM System Storage DS4000 Storage Manager version 10.10
SAN support	Supported IBM FC switches and directors (product numbers 2005, 2006, 2109, 2026, 2027, 2031, 2032, 2034, 2042, 2054, 2061 and 2062, and IBM BladeCenter®)
Warranty	Three year parts and labor warranty, 9x5 next business day, upgradeable to 24x7 with four hour response

Physical characteristics

Dimensions	H - 130.3 mm (5.13 in) W - 447.0 mm (17.6 in) D - 563.8 mm (22.2 in)
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Supported systems¹

For a list of currently supported servers, operating systems, host bus adapters, clustering applications and SAN switches and directors, refer to the DS4700 Express Interoperability Matrix available at ibm.com/storage/disk/ds4000/ds4700. For availability dates, configuration options, and attachment capabilities, refer to: ibm.com/storage/disk. The DS4700 Express is supported only in rack installations. With optional features, up to six DS4000 EXP810 Expansion Units can be attached to the DS4700 Express up to a maximum of 112 drives.



For more information

Contact your IBM representative,
IBM Business Partner or visit:

- ibm.com/storage/disk/ds4000/ds4700
- ibm.com/systems/express/storage

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¹ For specific details and configuration availability, please visit ibm.com/storage/disk.

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IBM Systems and Technology Group
Route 100
Somers, New York 10589

Produced in the United States

April 2008

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MB, GB and TB equal 1,000,000, 1,000,000,000 and 1,000,000,000,000 bytes, respectively, where referring to storage capacity. Actual storage capacity will vary based upon many factors and may be less than stated. Some numbers given for storage capacities give capacity in native mode followed by capacity using data compression technology.



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TSD01828-USEN-09